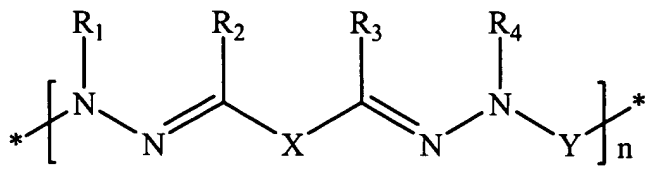


# CLAIMS

What is claimed is:

1. An organophotoreceptor comprising:

(a) a charge transport composition comprising molecules having the formula



where n is an average of a distribution of integers in which n is at least 2;

R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, and R<sub>4</sub> comprise, each independently, H, an alkyl group, an alkenyl group, a heterocyclic group, or an aromatic group;

X comprises an (N,N-disubstituted)arylamine group; and

Y is a bridging group;

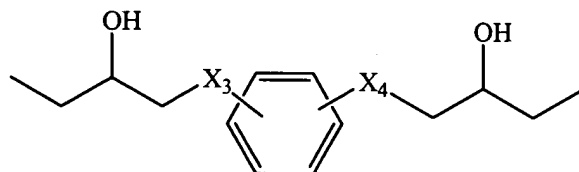
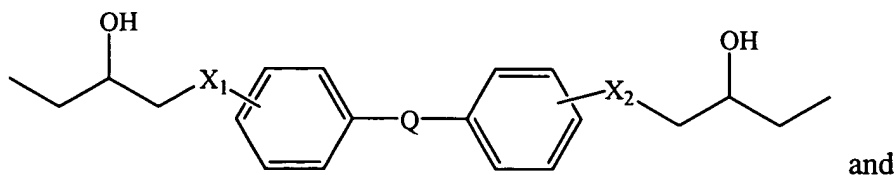
(b) a charge generating compound; and

(c) an electrically conductive substrate over which the charge transport composition and the charge generating compound are located.

2. An organophotoreceptor according to claim 1 wherein X is selected from the group consisting of a carbazole group, a julolidine group, a triarylamine group, a dialkylarylamine group, and an alkyl diarylamine group.

3. An organophotoreceptor according to claim 1 wherein Y comprises a -(CH<sub>2</sub>)<sub>m</sub>- group where m is an integer between 1 and 30, inclusive, and one or more of the methylene groups is optionally replaced by O, S, N, C, Si, B, P, C=O, O=S=O, a heterocyclic group, an aromatic group, urethane, urea, an ester group, an NR<sub>5</sub> group, a CR<sub>6</sub>, or a CR<sub>7</sub>R<sub>8</sub> group where R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub>, and R<sub>8</sub> are, each independently, a bond, H, hydroxyl, thiol, carboxyl, an amino group, an alkyl group, an alkenyl group, a heterocyclic group, an aromatic group, or part of a ring group.

4. An organophotoreceptor according to claim 3 wherein Y is selected from the group consisting of the formulae:



6 where Q, X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub>, and X<sub>4</sub> are, each independently, O, S, or NR' where R'  
7 comprises H, an alkyl group, an alkenyl group, a heterocyclic group, or an aromatic  
8 group.

1 5. An organophotoreceptor according to claim 1 further comprising an  
2 electron transport compound.

1 6. An organophotoreceptor according to claim 1 wherein said  
2 organophotoreceptor is in the form of a drum or a belt.

1 7. An organophotoreceptor according to claim 1 comprising:

- 2 (a) a charge transport layer comprising said charge transport composition  
3 and a polymeric binder; and  
4 (b) a charge generating layer comprising said charge generating compound and a  
5 polymeric binder.

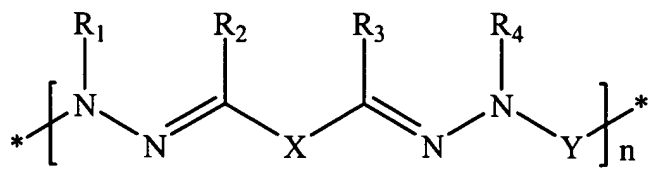
1 8. An organophotoreceptor according to claim 1 wherein n is at least 5.

1 9. An electrophotographic imaging apparatus comprising:

- 2 (a) a light imaging component; and  
3 (b) an organophotoreceptor oriented to receive light from the light  
4 imaging component, the organophotoreceptor comprising an electrically

conductive substrate and a photoconductive element on the electrically conductive substrate, the photoconductive element comprising:

(i) a charge transport composition comprising molecules having the formula



where n is an average of a distribution of integers in which n is at least 2;

R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, and R<sub>4</sub> comprise, each independently, H, an alkyl group, an alkenyl group, a heterocyclic group, or an aromatic group;

X comprises an (N,N-disubstituted)arylamine group; and

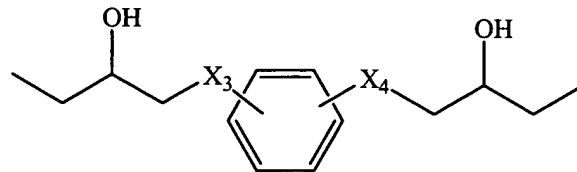
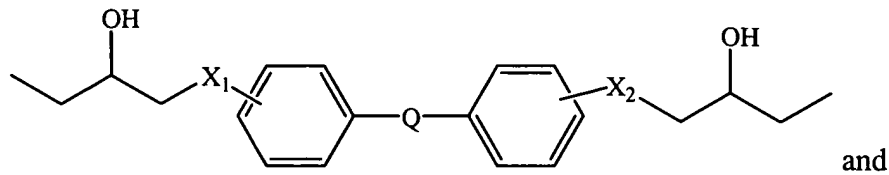
Y is a bridging group; and

(ii) a charge generating compound.

10. An electrophotographic imaging apparatus according to claim 9 wherein X is selected from the group consisting of a carbazole group, a julolidine group, a triarylamine group, a dialkylarylamine group, and an alkyl diarylamine group.

11. An electrophotographic imaging apparatus according to claim 9 wherein Y comprises a -(CH<sub>2</sub>)<sub>m</sub>- group where m is an integer between 1 and 30, inclusive, and one or more of the methylene groups is optionally replaced by O, S, N, C, Si, B, P, C=O, O=S=O, a heterocyclic group, an aromatic group, urethane, urea, an ester group, an NR<sub>5</sub> group, a CR<sub>6</sub>, or a CR<sub>7</sub>R<sub>8</sub> group where R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub>, and R<sub>8</sub> are, each independently, a bond, H, hydroxyl, thiol, carboxyl, an amino group, an alkyl group, an alkenyl group, a heterocyclic group, an aromatic group, or part of a ring group.

12. An electrophotographic imaging apparatus according to claim 11 wherein Y is selected from the group consisting of the formulae:



6 where Q, X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub>, and X<sub>4</sub> are, each independently, O, S, or NR' where R'  
7 comprises H, an alkyl group, an alkenyl group, a heterocyclic group, or an aromatic  
8 group.

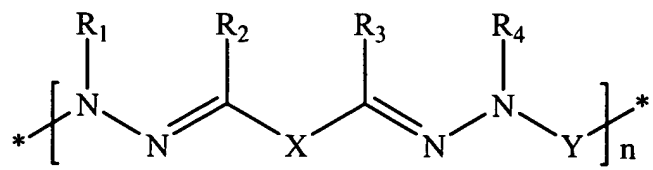
1 13. An electrophotographic imaging apparatus according to claim 9  
2 comprising a toner dispenser.

1 14. An electrophotographic imaging apparatus according to claim 9 further  
2 comprising an electron transport compound.

1 15. An electrophotographic imaging apparatus according to claim 9 wherein n  
2 is at least 5.

1 16. An electrophotographic imaging process comprising:  
2 (a) applying an electrical charge to a surface of an organophotoreceptor  
3 comprising an electrically conductive substrate and a photoconductive element on the  
4 electrically conductive substrate, the photoconductive element comprising:

5 (i) a charge transport composition comprising molecules having  
6 the formula



where n is an average of a distribution of integers in which n is at least 2;

R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, and R<sub>4</sub> comprise, each independently, H, an alkyl group, an alkenyl group, a heterocyclic group, or an aromatic group;

X comprises an (N,N-disubstituted)arylamine group; and

Y is a bridging group; and

(ii) a charge generating compound;

(b) imagewise exposing the surface of the organophotoreceptor to radiation to dissipate charge in selected areas and thereby form a pattern of charged and uncharged areas on the surface;

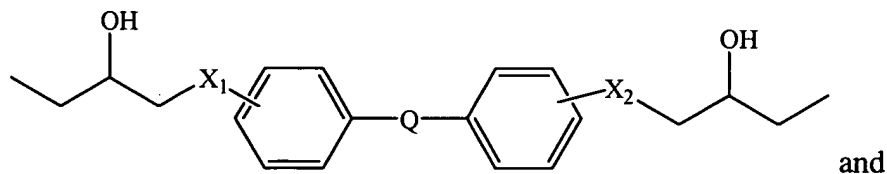
(c) contacting the surface with a toner to create a toned image; and

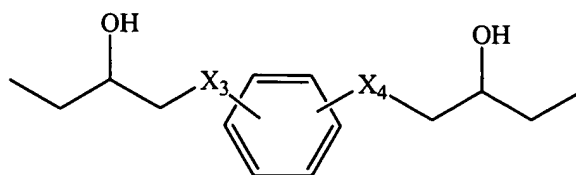
(d) transferring the toned image to a substrate.

17. An electrophotographic imaging process according to claim 16 wherein X is selected from the group consisting of a carbazole group, a julolidine group, a triarylamine group, a dialkylarylamine group, and an alkyl diarylamine group.

18. An electrophotographic imaging process according to claim 16 wherein Y comprises a  $-(CH_2)_m-$  group where m is an integer between 1 and 30, inclusive, and one or more of the methylene groups is optionally replaced by O, S, N, C, Si, B, P, C=O, O=S=O, a heterocyclic group, an aromatic group, urethane, urea, an ester group, an NR<sub>5</sub> group, a CR<sub>6</sub>, or a CR<sub>7</sub>R<sub>8</sub> group where R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub>, and R<sub>8</sub> are, each independently, a bond, H, hydroxyl, thiol, carboxyl, an amino group, an alkyl group, an alkenyl group, a heterocyclic group, an aromatic group, or part of a ring group.

19. An electrophotographic imaging process according to claim 18 wherein Y is selected from the group consisting of the formulae:





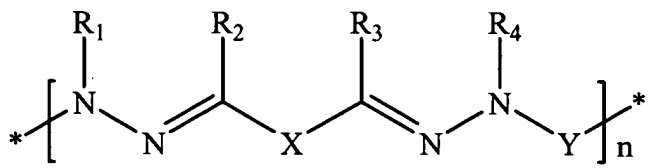
where Q, X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub>, and X<sub>4</sub> are, each independently, O, S, or NR' where R' comprises H, an alkyl group, an alkenyl group, a heterocyclic group, or an aromatic group.

20. An electrophotographic imaging process according to claim 16 wherein the toner comprises a dispersion of colorant particles.

21. An electrophotographic imaging process according to claim 16 further comprising an electron transport compound.

22. An electrophotographic imaging process according to claim 14 wherein n is at least 5.

23. A charge transport composition comprising molecules having the formula



where n is an average of a distribution of integers in which n is at least 2;

R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, and R<sub>4</sub> comprise, each independently, H, an alkyl group, an alkenyl group, a heterocyclic group, or an aromatic group;

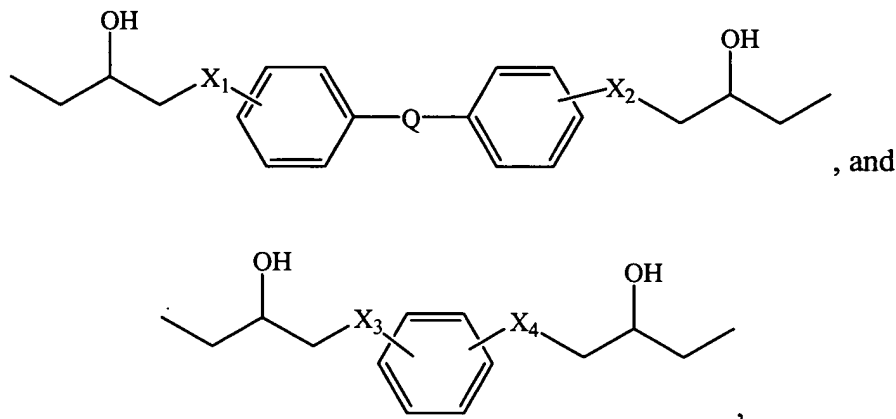
X comprises an (N,N-disubstituted)arylamine group; and

Y is a bridging group.

24. A charge transport composition according to claim 23 wherein X is selected from the group consisting of a carbazole group, a julolidine group, a triarylamine group, a dialkylarylamine group, and an alkyl diarylamine group.

25. A charge transport composition according to claim 23 wherein Y comprises a  $-(CH_2)_m-$  group where m is an integer between 1 and 30, inclusive, and one or more of the methylene groups is optionally replaced by O, S, N, C, Si, B, P, C=O, O=S=O, a heterocyclic group, an aromatic group, urethane, urea, an ester group, an  $NR_5$  group, a  $CR_6$ , or a  $CR_7R_8$  group where  $R_5$ ,  $R_6$ ,  $R_7$ , and  $R_8$  are, each independently, a bond, H, hydroxyl, thiol, carboxyl, an amino group, an alkyl group, an alkenyl group, a heterocyclic group, an aromatic group, or part of a ring group.

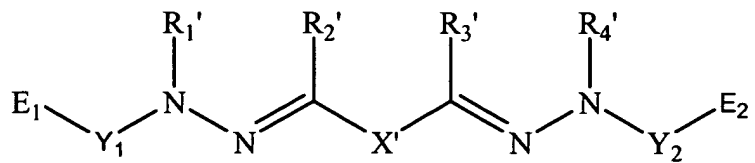
26. A charge transport composition according to claim 25 wherein Y is selected from the group consisting of the formulae:



where Q,  $X_1$ ,  $X_2$ ,  $X_3$ , and  $X_4$  are, each independently, O, S, or  $NR'$  where  $R'$  comprises H, an alkyl group, an alkenyl group, a heterocyclic group, or an aromatic group.

27. A charge transport composition according to claim 25 wherein n is at least 5.

28. A charge transport composition prepared by the reaction of a multifunctional compound with a di-reactive-ring compound having the formula



where  $R_1'$ ,  $R_2'$ ,  $R_3'$ , and  $R_4'$  comprise, each independently, H, an alkyl group, an alkenyl group, a heterocyclic group, or an aromatic group;  
 $X'$  comprises an (N,N-disubstituted)arylamine group; and  
 $Y_1$  and  $Y_2$  are, each independently, a linking group; and  
 $E_1$  and  $E_2$  are, each independently, a reactive ring group.

29. A charge transport composition according to claim 28 wherein  $X'$  is selected from the group consisting of a carbazole group, a julolidine group, a triarylamine group, a dialkylarylamine group, and an alkyl diarylamine group.

30. A charge transport composition according to claim 28 wherein  $Y_1$  and  $Y_2$ , each independently, comprise a  $-(CH_2)_k-$  group where  $k$  is an integer between 1 and 30, inclusive, and one or more of the methylene groups is optionally replaced by O, S, N, C, Si, B, P, C=O, O=S=O, a heterocyclic group, an aromatic group, urethane, urea, an ester group, an  $NR_{16}$  group, a  $CR_{17}$ , or a  $CR_{18}R_{19}$  group where  $R_{16}$ ,  $R_{17}$ ,  $R_{18}$ , and  $R_{19}$  are, each independently, a bond, H, hydroxyl, thiol, carboxyl, an amino group, an alkyl group, an alkenyl group, a heterocyclic group, an aromatic group, or part of a ring group.

31. A charge transport composition according to claim 28 wherein  $E_1$  and  $E_2$ , each independently, are selected from the group consisting of 3-, 4-, 5-, 7-, 8-, 9-, 10-, 11- and 12-membered heterocyclic ring groups.

32. A charge transport composition according to claim 31 wherein  $E_1$  and  $E_2$ , each independently, are selected from the group consisting of 3-, 4-, 5-, 7-, 8-, 9-, 10-, 11-, and 12-membered cyclic ethers, cyclic amines, cyclic sulfides, cyclic amides, N-carboxy- $\alpha$ -amino acid anhydrides, lactones, and cyclosiloxanes.

33. A charge transport composition according to claim 32 wherein  $E_1$  and  $E_2$ , each independently, are selected from the group consisting of epoxides, oxetanes, aziridines, thiiranes, 2-azetidinone, 2-pyrrolidone, 2-piperidone, caprolactam, enantholactam, and capryllactam.

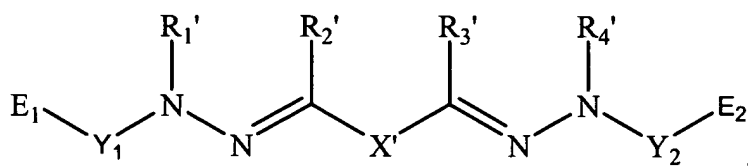


34. A charge transport composition according to claim 28 wherein the multi-functional compound is a di-functional compound.

35. A charge transport composition according to claim 34 wherein the difunctional compound is selected from the group consisting of a triol, a triamine, a trithiol, a diol, a dithiol, a diamine, a dicarboxylic acid, a hydroxylamine, an amino acid, a hydroxyl acid, a thiol acid, a hydroxythiol, and a thioamine.

36. An organophotoreceptor comprising:

(a) a polymeric charge transport composition prepared by the reaction of a multi-functional compound with a di-reactive-ring compound having the formula



where R<sub>1</sub>', R<sub>2</sub>', R<sub>3</sub>', and R<sub>4</sub>' comprise, each independently, H, an alkyl group, an alkenyl group, a heterocyclic group, or an aromatic group;

X' comprises an (N,N-disubstituted)arylamine group; and

**Y<sub>1</sub> and Y<sub>2</sub> are, each independently, a linking group; and**

E<sub>1</sub> and E<sub>2</sub> are, each independently, a reactive ring group; and

(b) a charge generating compound; and

(c) an electrically conductive substrate over which the charge transport composition and the charge generating compound are located.

37. An organophotoreceptor according to claim 36 wherein X' is selected from the group consisting of a carbazole group, a julolidine group, a triarylamine group, a dialkylarylamine group, and an alkyl diarylamine group.

38. A charge transport composition according to claim 36 wherein Y<sub>1</sub> and Y<sub>2</sub>, each independently, comprise a -(CH<sub>2</sub>)<sub>k</sub>- group where k is an integer between 1 and 30, inclusive, and one or more of the methylene groups is optionally replaced by O, S, N, C,

4 Si, B, P, C=O, O=S=O, a heterocyclic group, an aromatic group, urethane, urea, an ester  
 5 group, an NR<sub>16</sub> group, a CR<sub>17</sub>, or a CR<sub>18</sub>R<sub>19</sub> group where R<sub>16</sub>, R<sub>17</sub>, R<sub>18</sub>, and R<sub>19</sub> are, each  
 6 independently, a bond, H, hydroxyl, thiol, carboxyl, an amino group, an alkyl group, an  
 7 alkenyl group, a heterocyclic group, an aromatic group, or part of a ring group.

1 39. A charge transport composition according to claim 36 wherein E<sub>1</sub> and E<sub>2</sub>,  
 2 each independently, are selected from the group consisting of 3-, 4-, 5-, 7-, 8-, 9-, 10-, 11-  
 3 and 12-membered heterocyclic ring groups.

1 40. A charge transport composition according to claim 39 wherein E<sub>1</sub> and E<sub>2</sub>,  
 2 each independently, are selected from the group consisting of 3-, 4-, 5-, 7-, 8-, 9-, 10-, 11-  
 3 and 12-membered cyclic ethers, cyclic amines, cyclic sulfides, cyclic amides, N-carboxy-  
 4 a-amino acid anhydrides, lactones, and cyclosiloxanes.

1 41. A charge transport composition according to claim 40 wherein E<sub>1</sub> and E<sub>2</sub>,  
 2 each independently, are selected from the group consisting of epoxides, oxetanes,  
 3 aziridines, thiiranes, 2-azetidinone, 2-pyrrolidone, 2-piperidone, caprolactam,  
 4 enantholactam, and capryllactam.

1 42. A charge transport composition according to claim 36 wherein the multi-  
 2 functional compound is a di-functional compound.

1 43. A charge transport composition according to claim 36 wherein the di-  
 2 functional compound is selected from the group consisting of a triol, a triamine, a trithiol,  
 3 a diol, a dithiol, a diamine, a dicarboxylic acid, a hydroxylamine, an amino acid, a  
 4 hydroxyl acid, a thiol acid, a hydroxythiol, and a thioamine.